

529 Rec'd PCT/PTO 06 OCT 2000

DEVICE FOR MOISTENING A MATERIAL WEB

IN 5A1

The invention relates to a device for moistening a material web moved in the transport direction, preferably for re-moistening a paper or textile web dried after printing by means of a spray device for spraying a water mist on the material web under the influence of an electrostatic field generated by an electrostatic charging device according to the preamble of the main claim.

Sub
A2

Devices for re-moistening of this type are known of themselves (EP-0 350 606 A2). They have proven themselves in practice. It is disadvantageous however that these known systems usually are difficult to retrofit in existing systems. Finally, only a moderate degree of re-moistening can be achieved with this known device.

IN 5A3

The goal of the invention is to improve a device according to the species according to the preamble of the main claim so that a high degree of moistening can be achieved with small installation sizes.

Sub
A4

This goal is achieved in a device according to the species according to the preamble of the main claim according to the invention by these characterizing features.

Sub
A5

It is important for the principle according to the invention that the material web was charged electrostatically in a transport direction before the spraying device (surprisingly more than in the area of the corona electrode in the vicinity outside of the reversing roller) and the material web thus charged influences the sprayed water mist as a result of the electrical field due to the charging, so that the water particles of the spray mist

surprisingly are sucked up by the material web, in other words, the water aerosols with opposite charges relative to the paper penetrate the material while astonishingly the applied amount of water (about 2.5 g/m^2) has not led to any formation of surface water on the material web. In addition, the moisture profile of the water spray heads has not formed itself on the material web, which may be due to the dominance of the high and uniform distribution of the field strength in the form of a homogeneous field. With this design according to the invention, an efficiency of more than 95% and sometimes even 98% has been reached. In contrast to the known devices, this also has the advantage that significantly less components are required which is directly related to the space requirements of such a device for re-moistening. The latter has the particular advantage of being able to retrofit existing pressure systems simply.

A ~~Advantageous designs and improvements on the invention are characterized in the subclaims.~~

INSAW
A preferred embodiment of the invention is explained in greater detail with reference to the drawing and represents a schematic functional diagram with the device according to the invention.

INSAW
The material web marked 4 as a whole is guided in the transport direction v around a reversing roller represented as a whole by 3 (in the embodiment shown) with a wrap angle of 90° .

As an extension of the diameter passing through the tangent point (in the schematic cross section) the device represented as 1 as a whole is shown to perform electrostatic charging as a corona-charging electrode 1, with the charging direct current being represented by 2 which flows onto the

surface of material web 4. It is approximately 2 mA/m. The area of the material web is viewed as a tangent line which touches the jacket of reversing roller 3 in the transport direction.

Reversing roller 3 is a grounded drum which has a smooth, electrically conducting surface which is preferably high-gloss chrome-plated. It has been found that with this design of the charging electrode the material web is charged to its physically maximum field strength so that the electrical field E marked 5 results.

Material web 4 is then guided in the area of two grounded water spray heads 6 located opposite one another on different sides of material web 4. These heads form a spray cone marked schematically as a whole by 7. As a result of the influence, a field strength F marked as a whole by 8 acts on the water aerosols which it forces three-dimensionally into the interior of material web 4.

It is also possible instead of grounding to apply reverse polarity to reversing roller 3 and water spray heads 6. It is also possible for the top side of reversing roller 3 to be coated with polytetrafluoroethylene or risilan to prevent residues of printing ink separating from material web 4 at the surface of the roller.

With this design according to the invention, an efficiency of more than 95% and sometimes even 98% has been reached. In contrast to the known devices, there is also the advantage that definitely fewer components are required which is directly related to the associated space requirements of such a device for re-moistening. The latter has the particular advantage of being able to retrofit existing printing systems in simple fashion.